

REMARKS

Applicants respectfully request consideration of the subject application.

This Response is submitted in response to the Office Action mailed October 24, 2006. Claims 1-5, 7, 9-13, 15-23, 25-29, 31-35, 42-43 and 45-46 are pending. Claims 1-5, 7, 9-13, 15-23, 25-29, 31-35, 42-43 and 45-46 are rejected. In this Amendment, claims 1 and 42 have been amended. No new matter has been added.

35 U.S.C. §§ 102 and 103 Rejections

The Examiner has rejected claims 1-2, 5, 11-12, 15-16, 18-22, 25, 42 and 45 under 35 U.S.C. § 102(b) as being anticipated by Downing (U.S. Patent No. 4,910,642, hereinafter "Downing"). Claims 1-2, 4-5, 7, 9-13, 15-22, 25-29, 42-43, and 45-46 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Downing in view of Mittal, et al. (U.S. Patent No. 4,450,505, hereinafter "Mittal"), claims 10 and 31 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Downing in view of Mittal as applied to claims 1 and 29 above, and further in view of Yamamoto, et al. (U.S. Patent No. 4,729,060, hereinafter "Yamamoto"), Claims 32-35 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Downing in view of Mittal as applied to claims 1 and 29 above, and further in view of Hisano, et al. (U.S. Patent No. 5,198,889, hereinafter "Hisano").

Downing fails to teach or suggest all of the limitations of independent claims 1 and 42. In particular, Downing fails to teach or suggest a heat sink in contact with a closed end of a closed end in a compressed position and an expanded position. Instead, in Downing, the stack of plates is only connected to the heat transfer piece when the external bellows is in a compressed state and the internal bellows is in an expanded state.

Furthermore, Applicants submit one of skill in the art would not modify Downing with Mittal or Mittal with Downing to arrive at the presently claimed invention.

In Downing, the fluid coolant flows through the stack and the metal bellows expand when the coolant is initially pressure to move the cooler assembly into contact with the electronic module which acts as the heat source. When the coolant circuit is depressurized, the spring constant in the bellows will cause the assembly to retract from the module allowing servicing or replacement. Thus, in Downing, the resiliency and spring-like characteristics of the bellows does not urge the closed end with the integrated circuit. Instead, the pressurization of the coolant urges the internal bellows and external bellows together.

Downing discloses that the thermally conductive interface elastomer material interfaces between the bellows and the module so that any surface

irregularities on the module or misalignment between the assembly and module are accommodated without impeding the transfer of heat. The Examiner submits that Downing is inherently capable of conforming to an integrated circuit disposed at an angle. Applicants disagree. The Examiner points out that Applicants have amended the claims to claim a flexible channel conformable with an integrated circuit at an angle relative to the open end. Applicants note that in previous Office Actions, the Examiner submitted that the surface irregularities disclosed in Downing satisfied the non-planar limitation. Applicants disagreed. In the present application, non-planarity was defined as the integrated circuit being at an angle relative to the open end of the flexible channel. As discussed in previous Amendments, Downing discloses an external bellows and an internal bellows that are urged together and with the integrated circuit. As discussed above, the bellows in Downing do not have a spring-like force; instead, the coolant is pressurized and depressurized. Moreover, the plate stack attached by the internal bellows necessarily prevents the external bellows from conforming to an integrated circuit disposed at an angle because the movement of the external bellows is limited by the internal bellows. The stack of plates needs to be in planar contact with the metal end cap to effectively transfer heat.

Furthermore, Downing at col. 2, lines 17-23, indicates that it is disadvantageous to have “a single bellows provided per cooling device.”

Downing also discloses at col. 3, lines 42-49, surface irregularities or misalignments between the cooling device and the heat source are accommodated by an elastic contact pad or a thermally conductive elastomer.

In Mittal, a housing is divided to form first and second cooling portions. The chips are in the first cooling portion and several bellows extend into the first cooling portion so that each bellows is urged into deflecting contact with a respective chip. Similarly, Mittal does not teach or suggest a flexible channel being conformable with an integrated circuit disposed at an angle. Mittal specifically discloses: “Board 16 is well known and includes a plurality of integrated circuit chips 30 mounted thereon having a substantially planar surface 32.” (Col. 2, lines 31-33). As shown in Mittal and explained in Mittal at col. 2, lines 23-45, the integrated circuit is placed into a housing assembly such that the integrated circuit is planar (i.e., not disposed at an angle). That is, in Mittal, planarity issues are resolved by the first portion of the housing. The bellows in Mittal are provided to urge the cooling device into and out of contact with the chip. The bellows in Mittal are not provided to conform with an integrated circuit disposed at an angle.

Accordingly, one of skill in the art would not modify Downing with Mittal or Mittal with Downing.

Neither Yamamoto nor Hisano disclose a flexible channel that is conformable with integrated circuits disposed at an angle relative to the open end of the flexible channel.

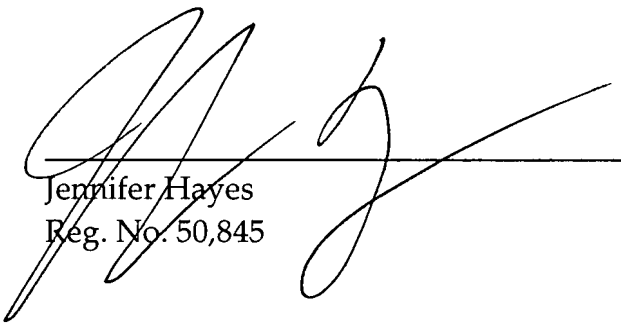
Therefore, neither Downing, Mittal, Yamamoto, Hisano, nor combinations thereof disclose or suggest the claimed limitations of independent claims 1 and 42. Claims 2-5, 7, 9-13, 15-23, 25-29, 31-35, 43, 45 and 46 depend, directly or indirectly, from one of the foregoing independent claims. Applicants, accordingly, respectfully request withdrawal of the rejections under 35 U.S.C. § 102 and § 103.

Applicants respectfully submit that the present application is in condition for allowance. If the Examiner believes a telephone conference would expedite or assist in the allowance of the present application, the Examiner is invited to call Jennifer Hayes at (408) 720-8300.

Please charge any shortages and credit any overages to Deposit Account No. 02-2666. Any necessary extension of time for response not already requested is hereby requested. Please charge any corresponding fee to Deposit Account No. 02-2666.

Respectfully submitted,
Blakely, Sokoloff, Taylor & Zafman LLP

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Jennifer Hayes
Reg. No. 50,845

1279 Oakmead Parkway
Sunnyvale, California 94085-4040
(408) 720-8300